

# Emission Reduction Plan for Ports and Goods Movement in California

(approved April 2006)



## South Coast Air Quality Management District Governing Board Study Session

August 4, 2006 Diamond Bar



**Air Resources Board**

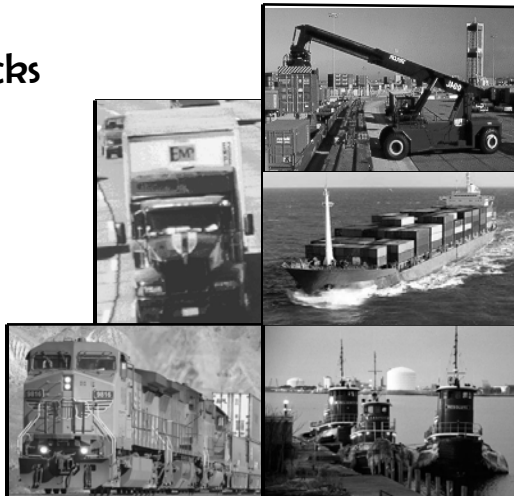
California Environmental Protection Agency

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### *Key Emission Sources*

- Heavy diesel trucks
- Locomotives
- Ships
- Harbor craft
- Cargo handling equipment



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## ***2005 Health Impacts from Goods Movement in South Coast***

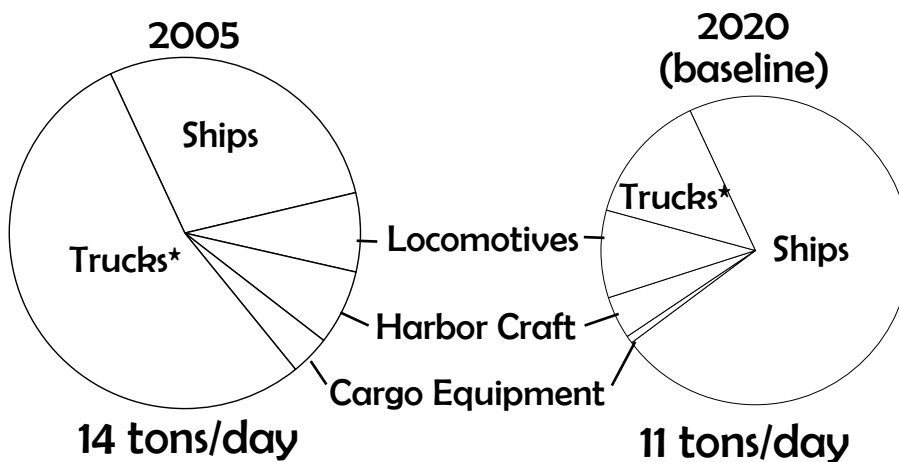
	<u>Cases/Year</u>
Premature death*	1,200
Hospital admissions (lung)	730
Hospital admissions (heart)	460
Acute bronchitis	2,900
Asthma/other respiratory	35,000
Absences/restricted days	2.3 million

*\*Uncertainty range is 360 to 2,100 deaths/year*

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## ***Diesel PM from Goods Movement in South Coast (to 24 nm offshore)***

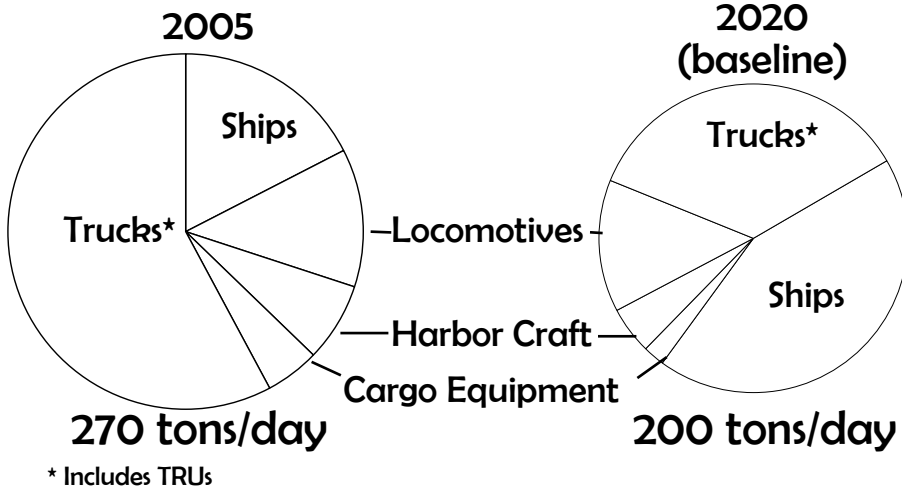


\* Includes TRUs

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## ***NO<sub>x</sub> from Goods Movement in South Coast (to 24 nm offshore)***



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## ***ARB Goals for Goods Movement***

### Reverse growth in emissions

- By 2010, reduce emissions as much as possible, at least to 2001 levels

### Reduce diesel PM risk

- Rapid reduction in community risk
- By 2020, reduce statewide risk 85%

### Attain all federal standards

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## *Emission Reduction Strategies*

- Cleaner engines and fuels
- Fleet modernization (retrofit or replace)
- Speed reduction and idling limits
- Shore-based power for ships and tugs
- Operational efficiencies
- Land use decisions
- Project and community specific mitigation
- Port programs

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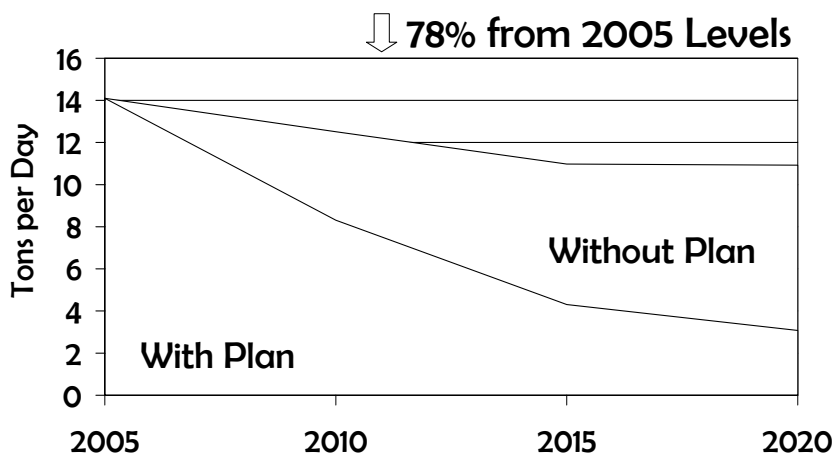
## *Statewide Benefits and Costs*

- Goes further than no net increase by 2010, brings emissions 20-40% below 2001 levels
- Reduces diesel PM risk 85% by 2020
- Achieves preliminary South Coast clean air targets for 2015 and 2020
- Cumulative cost to implement plan strategies (2006-2020): \$6 to \$10 billion
- Plan provides \$3-8 in benefits for each \$1 spent on controls

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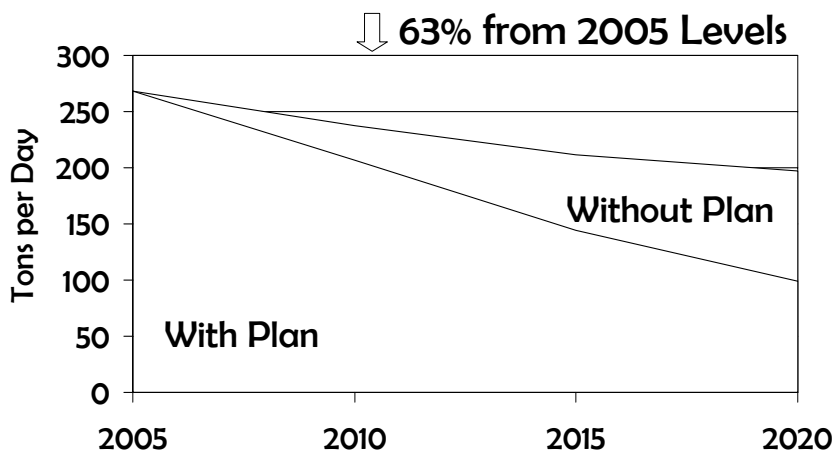
## ***Impact on Goods Movement Emissions in South Coast -- Diesel PM***



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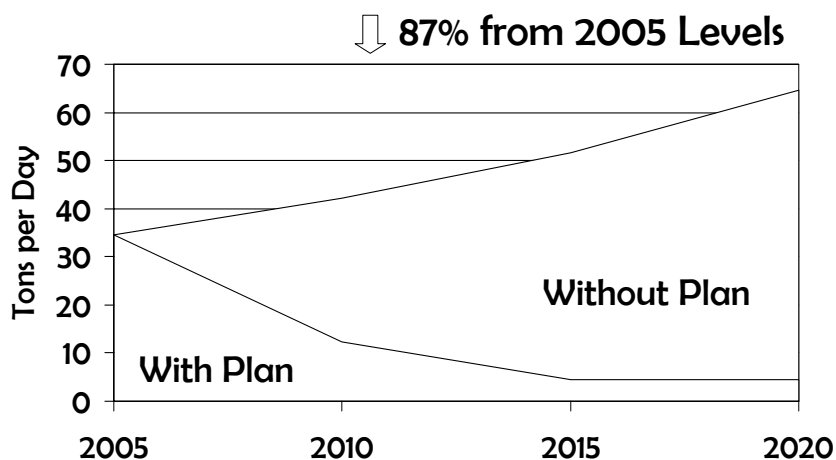
## ***Impact on Goods Movement Emissions in South Coast -- NO<sub>x</sub>***



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## *Impact on Goods Movement Emissions in South Coast – SO<sub>x</sub>*



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## *Reducing Health Risk in South Coast*

- Reduction in premature deaths attributed to emissions from goods movement:
  - 1,200 premature deaths/year currently
  - By 2020, over 800 premature deaths/year avoided by existing and planned controls
- Further localized risk reduction needed

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## ***ARB Action – April 20, 2006***

Board approved plan and directed staff to:

- Expediently pursue proposed ARB rules and other actions
- Work with port operators and others to reduce emissions and health risk
- Report back in November and every 6 months thereafter

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## ***Recently Adopted ARB Rules***

- ✓ Low sulfur fuel for trucks, equipment, harbor craft, in-state locomotives
- ✓ Truck idling limits
- ✓ International border trucks
- ✓ Ban on cruise ship incineration
- ✓ Marine auxiliary engine fuels
- ✓ Diesel cargo handling equipment
- ✓ Gas forklifts

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## ***New ARB Rulemaking or Alternatives --- Public Process Underway***

- ⊕ Port trucks
- ⊕ Privately-owned truck fleets
- ⊕ Shore power for ships and harbor craft
- ⊕ Ban on ship incineration (beyond cruise ships)
- ⊕ Harbor craft fleets & new engine standards

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## ***New ARB Rulemaking or Alternatives --- Beginning Soon***

- ⊕ Low sulfur fuel for ship main engines
- ⊕ Expanded ship speed reduction
- ⊕ Switcher/yard locomotive upgrades
- ⊕ “Green ship” construction and deployment to California service

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## ***Conclusions***

- Need expeditious action to cut community risk
- Reducing goods movement emissions is key for new clean air plans
- ARB will use its full authority
- Partnerships are critical for success
- Will take large effort and resources from industry, agencies, and the public

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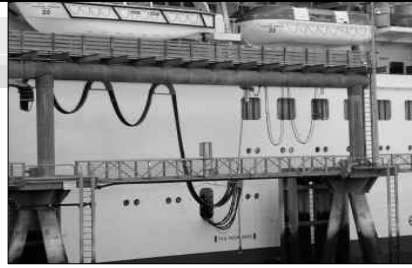


## ***Expanded Description of Emission Reduction Strategies***

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## ***Ships In/Near Port***



- ✓ ARB rule for clean auxiliary engine fuel
- Shore power or alternative technology  
(40% of ship visits by 2010, 100% by 2015)
- Retrofit controls on auxiliary engines
- Additional vessel speed reductions

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## ***Ships in California Coastal Waters***



- Cleaner fuel for main engines
- Bring cleaner ships to California service
  - Step 1: Ships retrofitted with controls  
(20% of visits by 2010, 50% by 2015)
  - Step 2: “Green” ships at 90% NOx/PM control  
(25% of visits by 2015, 50% by 2020)
  - By 2020: 90% of visits by either new green or retrofitted ships

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## *Trucks*



- ⊕ Port “drayage” truck modernization program
  - Incentives, ARB rule, ports as gatekeepers
  - Need for comprehensive approach
- ⊕ Statewide fleet rule for private trucks
- ✓ ARB rules for international trucks, anti-idling and low sulfur diesel

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## *Locomotives*



- ⊕ Upgrade switcher/local yard locomotives
- ⊕ More stringent national locomotive standards
  - Tier 3 for new engines (90%+ PM/NOx), cleaner rebuilds, anti-idling, diagnostics
- ⊕ Bring cleaner locomotives to California service
  - ✓ All Tier 2 engines in South Coast by 2010
  - 60% Tier 3 + cleaner rebuilt engines by 2015, 100% by 2020

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## *Harbor Craft*

- ⬢ ARB fleet rule for existing engines
- ⬢ Shore-based electrical power in port
- ⬢ Tighter U.S. EPA or ARB emission standards for new engines



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## *Cargo Equipment*

- ✓ ARB rule for new and existing *diesel* equipment
  - Replace all yard tractors with new, very low PM engines within 5 years
  - Ensure large reduction in NO<sub>x</sub>
- ✓ ARB rule for new and existing *gas* forklifts and other large industrial equipment



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